

U.S. Application No. 10/596,178
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AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A method for preparing nanoscale particles comprising the steps of:

(1) preparing a mixture comprising one or more active ingredients and solid fat as a solvent in an excess amount to the active ingredient, and

(2) pressurizing the mixture comprising one or more active ingredients and solid fat to the critical pressure or more by adding the gas of a supercritical fluid into the mixture, then removing the solid fat from the mixture by releasing out the solid fat together with the gas of the supercritical fluid, wherein the supercritical fluid is CO₂ or N₂ and wherein the temperature is maintained below the melting point of the solid fat; and

wherein the step (1) comprises adding one or more active ingredients, solid fat and optionally one or more surfactants into a reactor and melt-mixing them homogeneously.

2. (Canceled)

3. (Currently Amended) The method for preparing nanoscale particles according to claim 1, wherein the step (1) further comprises rapidly cooling the homogeneously melt-mixed mixture for solidification by pouring the mixture into a stainless steel plate which was pre-cooled to 10°C or less; pulverizing the solidified mixture; adding one or more surfactants and/or one or more non-surfactant type anti-coagulating agents or aqueous solution thereof to the pulverized powder and mixing them homogeneously; and drying the mixed product at room temperature.

4. (Currently Amended) A method for preparing nanoscale particles comprising the steps of:

(1) preparing a mixture comprising one or more active ingredients and solid fat as a solvent in an excess amount to the active ingredient, and

(2) pressurizing the mixture comprising one or more active ingredients and solid fat to the critical pressure or more by adding the gas of a supercritical fluid into the mixture, and

then removing the solid fat from the mixture by releasing out the solid fat together with the gas of the supercritical fluid, wherein the supercritical fluid is CO₂ or N₂ and wherein the temperature is maintained below the melting point of the solid fat,

wherein the step (1) comprises: adding one or more surfactants and solid fat into a reactor, and melt-mixing them homogenously; rapidly cooling the homogenously melt-mixed mixture for solidification by pouring the mixture into a stainless steel plate which was pre-cooled to 10°C or less; pulverizing the solidified mixture; adding one or more surfactants and/or one or more non-surfactant type anti-coagulating agents together with one or more active ingredients or aqueous solution thereof, to the pulverized powder and mixing them homogenously; and drying the mixed product at room temperature.

5. (Currently Amended) The method for preparing nanoscale ~~or amorphous~~ particles according to claim 1, wherein the step (1) comprises: adding one or more active ingredients, solid fat and optionally one or more surfactants into a reactor, further adding the gas of a supercritical fluid so as to provide a subcritical or supercritical condition, and then melt-mixing the mixture by heating.

6. (Currently Amended) The method for preparing nanoscale ~~or amorphous~~ particles according to claim 1, wherein the step (1) comprises: adding one or more active ingredients, solid fat and optionally one or more surfactants into a reactor, pressurizing the mixture to the critical pressure or more by adding the gas of a supercritical fluid into the mixture and then melt-mixing the mixture by heating, and spraying the melted mixture to the atmospheric pressure.

7. (Currently Amended) The method for preparing nanoscale ~~or amorphous~~ particles according to claim 1, wherein the step (1) comprises: adding one or more active ingredients, solid fat and optionally one or more surfactants into a reactor, pressurizing the mixture to the critical pressure or more by adding the gas of a supercritical fluid and then melt-mixing the mixture by heating, and then pulverizing the melted mixture by spraying it to the atmospheric pressure; adding one or more surfactants and/or one or more non-surfactant type anti-coagulating agents or aqueous solution thereof to the pulverized mixture and mixing them homogeneously; and drying the mixture at room temperature.

8. (Previously Presented) The method for preparing nanoscale particles according to claims 1 or 4, wherein the active ingredient is organic compounds, organometallic compounds, natural extracts, peptides, proteins or polysaccharides that exhibits physiological activities.

9. (Previously Presented) The method for preparing nanoscale particles according to claims 1 or 4, wherein the solid fat is a fat or a mixture of fats maintaining solid phase at the temperature of 30°C or less and having 40-150°C of melting point.

10. (Previously Presented) The method for preparing nanoscale particles according to claim 9, wherein the solid fat is selected from the group consisting of saturated fatty acids, esters and alcohols with C10-C22; mono- or di-glycerides having saturated fatty acid group with C10-C22; hydrocarbons with C16 or more; tri-glycerides having saturated fatty acid group with C10-C22; and a mixture thereof.

11. (Previously Presented) The method for preparing nanoscale particles according to claims 1 or 4, wherein the mixture prepared from the step (1) further comprises one or more material selected from the group consisting of synthetic surfactants, natural surfactants, lipids, polymers, monosaccharides, polysaccharides, dietary fibers, gums and proteins.

12. (Previously Presented) The method for preparing nanoscale particles according to claims 1 or 4, wherein the surfactant is at least one selected from the group consisting of synthetic surfactants, natural surfactants, lipids and polymers.

13. (Previously Presented) The method for preparing nanoscale particles according to claims 3 or 4, wherein the non-surfactant type anti-coagulating agent is at least one selected from the group consisting of monosaccharides, polysaccharides, dietary fibers, gums and proteins.

14. (Previously Presented) The method for preparing nanoscale particles according to claims 1 or 4, wherein the mixture prepared in the step (1) further comprises a co-solvent.

15. (Previously Presented) The method for preparing nanoscale particles according to claim 14, wherein the co-solvent is one or more alcohols with C2-C6.

16. (Previously Presented) The method for preparing nanoscale particles according to claims 1 or 4, wherein the temperature inside the reactor in the step (2) is below the melting point of the solid fat contained in the mixture prepared from the step (1).

17. (Previously Presented) The method for preparing nanoscale particles according to claims 1 or 4, wherein the temperature inside the reactor in the step (2) is 20-40°C.

18. (Previously Presented) The method for preparing nanoscale particles according to claims 1 or 4, wherein, in the step (2), the solid fat is removed from the mixture comprising one or more active ingredients and solid fat under 70-400 atm by adding the gas of a supercritical fluid to the mixture.

19. (Canceled)

20. (Previously Presented) The method for preparing nanoscale particles according to claim 7, wherein the non-surfactant type anti-coagulating agent is at least one selected from the group consisting of monosaccharides, polysaccharides, dietary fibers, gums and proteins.